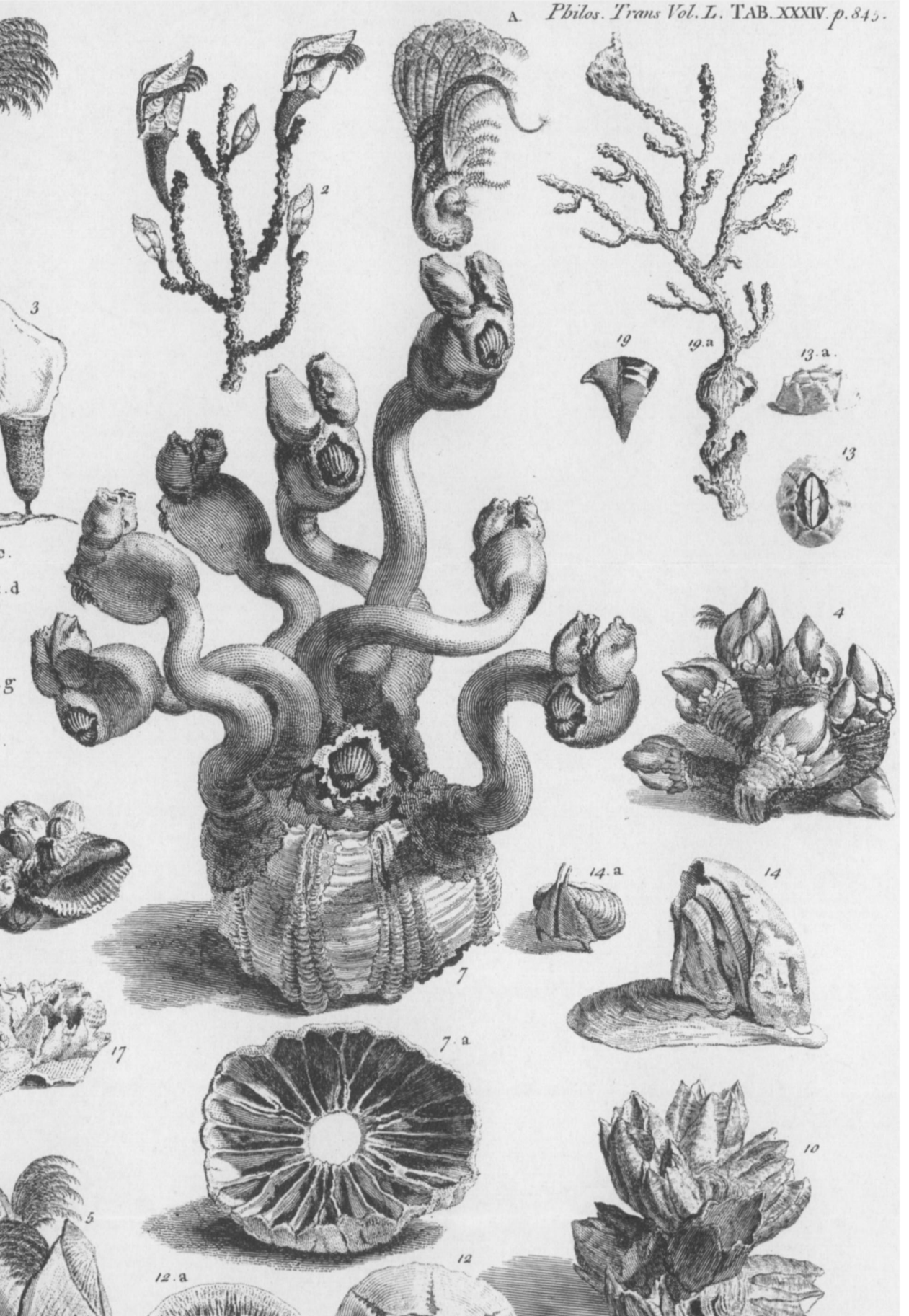

2.a
2
3
19
1.b
1.c
1.a
1.d
1.e
1.g
1.f
1.h
15
14.a
7
16
17
7.a
6
5
12.a
12


2
3
19
19.a
13.a
13
4
14.a
14
7
7.a
17
5
10
12
12.a

Lepades Pedatæ.

1. *Lepas nuda carnosa aurita*
1.a. *Ejusdem pars superior interna*
1.b. *Foramen auris internum*
1.c. *Cirrhi* (1.d) *Proboscis et* (1.e) *Os*
1.f. *Dens serratus, quorum octo sunt*
1.g. *Idem per Microscopium visus*
1.h. *Scapus longitudinaliter dissectus*
2. *Scalpellum Norwegicum Keratophytum*
2.a. *Idem per Microscopium visum*
3. *Scalpellum ex mari Britannico*
4. *Cornu copiæ, Pousiepieds Gallorum*
5. *Concha Anatifera vulgaris*
6. *Concha Anatifera prolifera*
A. *Animal Lepadis seu Triton Linnæi*

Barnicles *with Stems*.

1. *Naked fleshy Barnicle with Ears*
1.a. *The inside of the upper part of the same*
1.b. *The internal opening of the Ear*
1.c. *The Plumes* (1.d) *Trunck* (1.e) *and Mouth*
1.f. *A saw edg'd tooth of which there are 8*
1.g. *The same magnified*
1.h. *The Stem cut in two lengthways*
2. *The Norway Seafan Penknife*
2.a. *The same magnified*
3. *The British Channel Penknife*
4. *The Horn of plenty or French Poussepied*
5. *The common Duckbearing Barnicle*
6. *The branch'd Duckbearing Barnicle*
A. *Animal of the Barnicle or Linnæus's Triton*

Lepades Sessiles Balani dictæ.

7. *Pediculus Ceti* (7.a) *Idem reversus*
8. *Calyciformis Orientalis*
9. *Tintinnabuliformis*
10. *Tulipiformis ex Corallio rubro*
11. *Fistulosa conica* (11.a) *eadem reversa*
12. *Verruca Testudinaria* (12.a) *eadem reversa*
13. *Verruca Cancri Americani* (13.a) *eadem alatere*
14. *Capensis ore obliquo* (14.a) *eorum operculis cornutis*
15. *Subovalis crassa, ore minore*
16. *Cornubiensis conica, ore minore*
17. *Anglica vulgaris ore patulo*
18. *Arctica Patelliformis*
19. *Calceolus* (19.a) *Idem Keratophyto involutus*
20. *Diadema Persarum*

Barnic

7. *The Wh*
8. *The Ea*
9. *The Ba*
10. *The Re*
11. *The pip*
12. *The Tort*
13. *The Ame*
14. *The Cape*
15. *The Egg*
16. *The Corn*
17. *The com*
18. *The Gre*
19. *The Slip*
20. *The Per*

Barnicles *with Stems*. Lepades Sefsiles Balani dictæ. Barnicles *adhering by the base of their Shells.*

.....	1. *Naked fleshy Barnicle with Ears.*	7. *Pediculus Ceti* (7.a) *Idem reversus*	.....	7. *The Whales Louse* (7.a) *The underside*	.....
..... na	1.a *The inside of the upper part of the same.*	8. *Calyciformis Orientalis*	.....	8. *The East India cup shap'd Barnicle*	.....
.....	1.b *The internal opening of the Ear.*	9. *Tintinnabuliformis*	.....	9. *The Bell shap'd Barnicle*	.....
..... e) Os	1.c *The Plumes* (1.d) *Trunck* (1.e) *and Mouth.*	10. *Tulipiformis ex Corallio rubro*	.....	10. *The Red Coral Tulip Barnicle*	.....
..... sunt	1.f. *A saw edg'd tooth of which there are 8.*	11. *Fistulosa conica* (11.a) *eadem reversa*	.....	11. *The pipy conical Barnicle* (11.a) *The underside.*	
..... sus	1.g. *The same magnified*	12. *Verruca Testudinaria* (12.a) *eadem reversa*	.....	12. *The Tortoise Wart* (12.a) *The underside*	.....
..... pectus	1.h. *The Stem cut in two lengthways*	13. *Verruca Cancri Americani* (13.a) *eadem alatere*	.....	13. *The American Crab Wart* (13.a) *The same sideways.*	
..... Keratophytum	2. *The Norway Seafan Penknife*	14. *Capensis ore obliquo* (14.a) *cum operculis cornutis*	.....	14. *The Cape sidemouth Barnicle* (14.a) *with hornd covers*	.....
..... isum	2.a *The same magnified*	15. *Subovalis crassa, ore minore*	.....	15. *The Egg shap'd thick Barnicle with a small mouth*	.....
..... nnico	3. *The British Channel Penknife*	16. *Cornubiensis conica, ore minore*	.....	16. *The Cornish cone Barnicle with a small mouth*	.....
..... Gallorum	4. *The Horn of plenty or French Poulsepied*	17. *Anglica vulgaris ore patulo*	.....	17. *The common English Barnicle with a wide mouth*	.....
..... s	5. *The common Duckbearing Barnicle*	18. *Arctica Patelliformis*	.....	18. *The Greenland Limpet shap'd Barnicle*	.....
..... a	6. *The branch'd Duckbearing Barnicle*	19. *Calceolus* (19.a) *Idem Kentrophyto involutus*	.....	19. *The Slipper* (19.a) *The same coverd with the Seafan*	.....
..... ton Linnæi	A. *Animal of the Barnicle or Linnæus's Triton*	20. *Diadema Persarum*	.....	20. *The Persian Crown*	.....

it for a particular ſubſtance or body; but having examined it, I obſerved it was only a pellicle, or membrane, that covered a part of the *papillæ* I mentioned. This membrane has ſixteen ſeparations, which form kinds of purſes, and yet leave, in the center of the animal, an empty ſpace, wherein ſeveral glands are brought in view. I do not know, whether, in the natural ſtate, theſe membranes do not retire to the circumference, in order to diſcover the glands within, which they uſually hide, and which fill up all the middle of the crown; but when the fleſhy body is gone up again, it covers all the interior parts, cloſes them in, and preſerves them from the touch of any extraneous body. I cannot tell how theſe fiſhes live, or what is their mechaniſm; for I could not diſtinguiſh either a mouth, or any *viſcera*, nor any other organ ſerving to their nouriſhment.

CXIII. *An Account of ſeveral rare Species of Barnacles. In a Letter to Mr.* Iſaac Romilly, *F. R. S. from* John Ellis, *Eſq; F. R. S.*

Dear Sir, London, Dec. 21. 1758.

Read Dec. 21, 1758. THOSE rare and very extraordinary new ſpecies of Barnacles, which you have lately received from abroad, are ſo different from any of the common ſpecies, that I have ſeen, that I was reſolved to inquire into the nature of an animal, which, like a Proteus, appears in ſo many different

different ſhapes or coverings in different parts of the the world. For this end I have conſulted that excellent collection in the Britiſh Muſeum, and ſome others in the cabinets of my curious friends.

In this inquiry I met with ſome very rare ones, which have not yet been deſcribed, as you will obſerve in the annexed plate [*See* TAB. XXXIV.], where I have given exact drawings of yours, as well as the other ſpecies of this genus.

This marine animal is called, by writers on natural hiſtory, Balanus, and Concha Anatifera: but the celebrated Profeſſor at Upſal, Dr. Linnæus, calls the internal active part, or fiſh, the Animal Triton, and the covering or teſtaceous habitation Lepas, which he ſays is a multivalved ſhell, compoſed of unequal valves. The Animal Triton he deſcribes, as having an oblong body, a mouth with a tongue in it, twiſted about in a ſpiral manner; ſixteen tentacula or claws: ſix of the hinder ones on each ſide, he ſays, are cheliferous.

This account differing from that given by the ingenious Mr. Turberville Needham, F. R. S. in his Microſcopical Eſſays, I ſhall give the character of this animal, as it appeared to me from the many obſervations I made on it, while alive in ſalt water; and theſe I compared not only with many dried ſpecimens of other varieties, but likewiſe with ſome of yours, that were preſerved in ſpirits; and I found that the parts of the animal agree in all the ſpecies.

The experiments, that I made, were on the common Engliſh Barnacle, which is very frequently met with, at this time of the year, on oyſters and other ſhell-fiſh. The microſcope, that I made uſe of to obſerve

obſerve it, was Mr. Cuff's aquatic one; where the animal, when taken out of the ſhell, may be put into the watch-glaſs with ſalt water, or ſpread on the round glaſs plate on the ſtage of the microſcope, and kept moiſt with a hair pencil and ſalt water during the time of obſervation: this will keep the claws and proboſcis alive and in motion for many hours together.

This animal has 24 claws, or cirrhi *(See Fig.* A), which are diſpoſed in the following manner: the 12 longeſt ſtand erect, ariſing from the back part of the animal: they are all joined in pairs near the bottom, and inſerted in one common baſe. Theſe appear like ſo many yellow curled feathers: they are clear, horny, and articulated. Every joint is furniſhed with two rows of hairs on the concave ſide. The animal, in order to catch its prey, is continually extending and contracting theſe arched hairy claws, which ſerve it for a net.

The 12 ſmalleſt claws are placed next to theſe, ſix on each ſide: theſe are divided into pairs; that is, two claws to one ſtem, like the chelæ or claws of the crab. Theſe are more pliable, and fuller of hairs, than the others, and ſeem to do the office of hands for the animal.

The whole number of claws leſſen in ſize gradually each way, from the talleſt in the back, to the laſt but one of each ſide in the front; which laſt two are of the middle ſize.

The proboſcis, or trunk, riſes from the middle of the baſe of the larger claws, and is longer than any of them: this the animal moves about in any direction with great agility: it is of a tubular figure,

tranſ-

tranſparent, compoſed of rings leſſening gradually to the extremity, where it is ſurrounded with a circle of ſmall briſtles, which likewiſe are moveable at the will of the animal. Theſe, with other ſmall hairs on the trunk, diſappear when it dies.

Along the inſide of this tranſparent proboſcis the ſpiral dark-coloured tongue appears very plain: this the animal contracts and extends at pleaſure.

The mouth appears like that of a contracted purſe, and is placed in front, between the fore claws. In the folds of this membraneous ſubſtance are ſix or eight horny laminæ or teeth ſtanding erect, each having a tendon proper to direct its motion. Some of theſe teeth are ſerrated, others have tufts of ſharp hairs inſtead of indentations on the convex ſide, that point down into the mouth; ſo that no animalcule that becomes their prey can eſcape back.

Under the mouth lie the ſtomach, inteſtines, and the tendons by which they adhere to the ſhell.

This then is the general character of the animal of the whole genus, whether with ſtems or without.

I ſhall now give you a ſhort deſcription of the ſeveral kinds I have met with, beſides thoſe of your own, and ſhall divide them into two kinds; thoſe that have ſtems, and thoſe that adhere by their ſhelly baſes.

The firſt and moſt remarkable of thoſe that have ſtems is the Barnacle, *Fig.* 1. This differs from the Lepas of Linnæus in not having a teſtaceous, only a cartilaginous or fleſhy covering. On the top of it are two erect tubular figures like ears: theſe have a communication with the internal parts of the animal *(See Fig.* 1, *b)*. Theſe inner parts agree with the general

general character already given. The ſtem, which is here diſſected, was full of a ſoft ſpongy yellow ſubſtance, which appeared, when magnified, to conſiſt of regular oval figures, connected together by many ſmall fibres, and no doubt are the ſpawn of the animal.

This extraordinary animal (of which there were ſeven together) was found ſticking to the Whale Barnacle (*See fig.* 1. & 7.), by Mr. Smith of Stavenger in Norway, who cut both kinds together off a whale's lip, that was thrown upon that coaſt laſt year, 1757, and immediately immerſed them in ſpirits of wine; by which means we have been able more exactly to deſcribe them.

I have called this animal the Naked Fleſhy Barnacle with Ears; but it appears to claim the name of Triton rather than Lepas, according to Linnæus, as having no ſhelly habitation.

Fig. 2. is the next animal of this claſs: this is not yet deſcribed. I found ſeveral of them ſticking to the Warted Norway Sea Fan, which Dr. Pantoppidan, the Biſhop of North Bergen, ſent you: from its appearance, I have called it the Norway Sea Fan Penknife. The ſtem of this is covered with little teſtaceous ſcales. The upper part of the animal is incloſed in thirteen diſtinct ſhells, ſix on each ſide, beſides the hinge-ſhell at the back, which is common to both ſides: theſe are connected together by a membrane that lines the whole inſide. One of theſe is magnified a little at fig. 2. *a*, in order to expreſs the figure and ſituation of each ſhell the better.

Fig. 3. is taken from D'Argentville's *Lithologie*, *Pl.* 30. *fig.* H, who ſays it is found in the Britiſh

channel ſticking to ſea plants; and that theſe ſhells conſiſt of five pieces. This, from its appearance, I have called the Britiſh Channel Penknife, to diſtinguiſh it from the other.

Fig. 4. is a ſpecies of Barnacle called Pouſſepieds by the French, and deſcribed by Rondeletius as commonly found adhering to rocks on the coaſt of Brittany. He ſays the people there boil and eat the ſtem, which is firſt of a mouſe-colour, and afterwards becomes red like our prawns. There are many heads, that ariſe out of one ſtem, each of which conſiſts of two ſhells, in which are the ſame parts of the animal as in the other ſpecies. This I have called the Cornucopia Barnacle. Some of the ſhells of this Barnacle were drawn from a ſpecimen in the Britiſh Muſeum. This Lepas is the Mitella of Linnæus.

Fig. 5. and 6. are the Barnacles called Conchæ Anatiferæ: theſe are the ſorts ſo well known to ſailors, and formerly ſuppoſed to produce a large ſpecies of duck called a Barnacle. Theſe conſiſt of five ſhells. The tube, that ſupports one of theſe kinds, branches out like ſome ſpecies of corallines, bearing a ſhelled animal at the end of each branch. They are generally found adhering to pieces of wood in the ſea, and moſt ſhips have ſome of them ſticking to their bottoms. Thoſe of the ſouthern and warmer climates are generally of a larger kind than thoſe of the colder and more northern climates.

The next diviſion of theſe animals is, thoſe that adhere by the baſe of their ſhells, having no ſtems.

Here I muſt obſerve, that the bottoms of the ſeveral ſpecies of this diviſion conform in ſhape to the ſubſtances they adhere to, or graſp them in ſuch a peculiar

peculiar manner, as to render their ſituation ſecure from the violence of the element they live in. Another proviſion of nature for the ſecurity of theſe animals are the four opercula, which, upon their retreating into the great ſhell, they can draw to ſo cloſe after them, as to ſecure themſelves from outward danger.

Fig. 7. repreſents the Whale Barnacle, called Pediculus Ceti, juſt as it was cut off the whale's lip, with the ſeven naked Barnacles with ears, already deſcribed. *Fig.* 7. *a* is the bottom of the ſhell. This has the appearance of the gills of a muſhroom. All the ſpaces between theſe laminæ were filled with the blubber of the whale: by this means they adhere to the griſtly ſkin of the fiſh. The narrow cavities between the branched laminæ are the places where the ligaments or tendons, that move the opercula, are inſerted.

Fig. 8. is the Cup Barnacle, taken off an Eaſt India ſhip from Sumatra. The teſtaceous flat bottom of this was marked with the ſeams and lines of the ſheathing, and with the ruſt of the nails. In one of theſe ſhells the animal is repreſented protruding his claws thro' the opercula.

Fig. 9. is called the Bell-ſhaped Barnacle. This was taken off the bottom of a ſhip from Jamaica, and had its flat teſtaceous baſe marked as the former.

Fig. 10. This repreſents part of a moſt elegant ſpecimen in the curious collection of Dr. John Fothergill. It is called the Tulip Barnacle, and very properly, as well from the ſhape of its ſhell, as the beautiful ſtripes of red mixt with white. It adheres to a piece of the true red coral, and was fiſhed up

near Leghorn, on the coaſt of Italy. It is not improbable, but that theſe groups of Barnacles, growing at the ſame time with the animals that formed the red coral, may have received an addition to their fine red colour from the coral.

Fig. 11. is a group of Barnacles of a conical form, compoſed of purpliſh tubes like ſmall quills. *Fig.* 11. *a* repreſents one of the ſame, with a view of its baſe, from the collection of Mr. Peter Collinſon, F. R. S. This was brought from the Eaſt Indies. The inſides of theſe ſhells have the appearance of the ſpongy parts of bones.

Fig. 12. is called the Tortoiſe-wart Barnacle, being often found upon that animal. This ſhell is of a plano-convex ſhape, and looks like poliſhed ivory. The diviſions between the valves repreſent a ſtar with ſix points. If theſe ſhells are put into ſoap lees, they will in a few hours ſeparate into ſix pieces or valves, each ſhelly valve having two ears, like the ſcallop-ſhell: ſo that this ſpecies has its valves connected by membranes, inſtead of teſtaceous ſutures, as moſt of the others have. *Fig.* 12. *a* repreſents the under part of the ſame ſhell.

Fig. 13. This ſhell is marked with ſix rays like a ſtar, as the former; but is much deeper in proportion to its diameter. Several of this kind were found ſticking to a crab, that was lately brought from the iſland of Nevis; from whence I have called it the American Crabs-wart.

Fig. 14. is called the Side-mouth Barnacle. This was found on the ſouthern coaſt of Africa, near the Cape of Good Hope, where it adheres to a particular ſpecies of ſtriated purple muſcle. *Fig.* 14. *a* repreſents

ſents two of the opercula of this Barnacle remarkably horned. The ſhell of this is very thin; but its obliquity may probably be owing to its ſituation.

Fig. 15. This egg-ſhaped Barnacle with a ſmall mouth is found in cluſters ſticking to the Buccinum tribe of ſhells in the Weſt Indies.

Fig. 16. is the Corniſh Barnacle, ſhaped like a cone, and with a ſmall mouth. This is deſcribed and figured by the Revd. Mr. William Borlaſe, F.R.S. in his Natural Hiſtory of Cornwall, lately publiſhed.

Fig. 17. This is the common Engliſh Barnacle, that is found in ſuch plenty upon all rocks and ſhells round this iſland. From the animal of this, examined in the microſcope, I have taken the character of the fiſh of the Barnacle genus.

Fig. 18. This I have called the Limpet-ſhaped Barnacle, from its likeneſs to ſome ſpecies of that ſhell. I am indebted to our late worthy member, Mr. Arthur Pond, for this ſhell, who aſſured me it was brought to him from Greenland. It was, with ſeveral more, found ſticking to a very large ſpecies of muſcle.

Fig. 19. *a.* This Sea-Fan, with the Barnacles incloſed in it, was brought from Gibraltar. I have called it the Slipper Barnacle, from its ſhape. *See Fig.* 19. Theſe ſhell-fiſh adhere, while they are young, to the ſlender branches, which are produced by the animals that compoſe this ſpecies of Sea-fan; and as the next ſucceſſion of young animals of this ſea-fan creep up its ſides, to increaſe the bulk and extenſion of theſe firſt-formed ramifications, they incloſe the ſhells all round, leaving only their mouths or apertures open, for the Barnacles to procure their food.

food. But it frequently happens, that the animals of the Sea-fans deſtroy theſe Barnacles, by overrunning and involving them in the very center of their ſtems. Theſe ſmall Barnacles, interſperſed here and there on the branches, have been taken for fruit or berries by ſome gentlemen, who look upon the internal or horny part of the Sea-fans to be vegetables.

Fig. 20. is a very curious Barnacle, taken from an elegant ſpecimen in the Britiſh Muſeum; which, from its figure, I have called the Perſian Crown.

I ſhall now add ſome further obſervations on the nature of theſe animals.

Upon opening the ſhells of many of the common Engliſh Barnacles (*Fig.* 1.) while they were alive, I found the lower part of the ſhell, which contained a cavity equal to two thirds of the whole, full of ſpawn; ſo that the Barnacles, which adhere by the baſe of their ſhells, as well as thoſe that are ſupported by fleſhy tubes, are propagated by eggs, which they ſend forth in inconceivable numbers; as appears by the cluſters of young ſhells, which we find adhering not only to the parent animals, but to all hard ſubſtances near them.

The bottom ſhell of theſe animals, as well as their upper ſhells, vary in form according to their ſituation, which occaſions ſome difficulty in determining their ſeveral ſpecies with exactneſs. The form of the baſe ſhell of our common Engliſh Barnacle, is the flat radiated figure repreſented adhering to a ſcallop ſhell in the front of a group of them at *Fig.* 17. The Barnacles at *Fig.* 8, 9. 14, 15. and 20. have the ſame kind ofbaſe.

I have very lately obſerved a ſingular kind of flat Balanus, on a white Mandrepora coral from the coaſt of Italy, in the poſſeſſion of Mr. Mendez D'Acoſta, F.R.S. whoſe baſe appears ſunk into the coral, and of the form of an inverted cone, bending a little to one ſide. The inward ſurface of this conical baſe ſhell appears curiouſly ſtriated with tubular radii, which terminate on the ſurface of the coral, to receive the extremities of the ſix valves, that compoſe the upper ſhell. This peculiar form of the baſe ſeems owing to the animals of the coral and of the Barnacle growing up together, the latter keeping poſſeſſion of its proper ſpace, while the former grew cloſe about it.

The bottom ſhell of the Barnacle like a Limpet, at *Fig.* 18. increaſes from a ſmall point by many thin ſhelly margins, which exactly correſpond to the indentations which we obſerve on the baſe of the outward ſhell; ſo that it appears not unlike the drawing of a fortification in miniature.

I am,

Dear Sir,

Your moſt affectionate Friend,

John Ellis.

P. S. The Rev. Mr. William Borlaſe is now of opinion, that the Corniſh Barnacle at *Fig.* 16. which he has deſcribed in his Hiſtory of Cornwall, is rather a Limpet or Patella.